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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/720,492	11/24/2003	Tracy Fulghum	4015-5133	4554

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COATS & BENNETT, PLLC  
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EXAMINER
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BURD, KEVIN MICHAEL

ART UNIT	PAPER NUMBER
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2611

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/04/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/720,492

Applicant(s)

FULGHUM ET AL.

Examiner

Kevin M. Burd

Art Unit

2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-89 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-89 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

1. Claims 83-89 are rejected under 35 U.S.C. 112, first paragraph, as being subject to an undue breadth rejection. A single means claim, i.e., where a means recitation does not appear in combination with another recited element of means, is subject to an undue breadth rejection under 35 U.S.C. 112, first paragraph. *In re Hyatt*, 708 F.2d 712, 714-715, 218 USPQ 195, 197 (Fed. Cir. 1983) (A single means claim which covered every conceivable means for achieving the stated purpose was held nonenabling for the scope of the claim because the specification disclosed at most only those means known to the inventor.). When claims depend on a recited property, a fact situation comparable to *Hyatt* is possible, where the claim covers every conceivable structure (means) for achieving the stated property (result) while the specification discloses at most only those known to the inventor.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Art Unit: 2611

2. Claims 1, 3-5, 7, 12, 14, 16, 18, 20, 21, 28, 31-35, 40, 44-52, 58, 62-68, 71, 74-79, 81-85, 87 and 89 are rejected under 35 U.S.C. 102(b) as being anticipated by Butler et al (US 2002/0131479).

Regarding claims 1, 3, 5, 7, 12, 14, 16, 18, 20, 32-35, 40, 44-46, 48-51, 58, 77, 78, 83, 84 and 89, Butler discloses a RAKE receiver and method of using the RAKE receiver shown in figure 4. Butler discloses a plurality of RAKE fingers to despread symbols received over the multiple paths of a multi-path channel (figure 4). Each finger comprises a delay of each of the multi-paths (paragraph 0077). The receiver outputs a signal from the despreader 442 that represents the cross-correlation between the interfering PN sequences and the PN sequence for the desired multi-path (paragraph 0106). A combiner 438a combines the data to be recovered and the interference component to reduce the ISI attributed to the interference and the desired symbol (figure 4 and paragraphs 0107 and 0109). A symbol combiner 432 combines the symbols from a plurality of RAKE fingers.

Regarding claim 4, a two-multi-path RAKE receiver configuration is shown in figure 4 (paragraph 0106).

Regarding claims 21, 28, 31, 67, 68, 71 and 74-76, Butler discloses a RAKE receiver and method of using the RAKE receiver shown in figure 4. Butler discloses a plurality of RAKE fingers to despread symbols received over the multiple paths of a multi-path channel (figure 4). Each finger comprises a delay of each of the multi-paths (paragraph 0077). Matched filter response weighting is used to determine a cross correlation term between the spreading sequence in the i-th multi-path and the

despreading sequence for the j-th multi-path (paragraph 0077). The receiver outputs a signal from the despreader 442 that represents the cross-correlation between the interfering PN sequences and the PN sequence for the desired multi-path (paragraph 0106). A combiner 438a combines the data to be recovered and the interference component to reduce the ISI attributed to the interference and the desired symbol (figure 4 and paragraphs 0107 and 0109). A symbol combiner 432 combines the symbols from a plurality of RAKE fingers.

Regarding claims 47, 52, 62-66, 79, 81, 82, 85 and 87, Butler discloses matched filter response weighting is used to determine a cross correlation term between the spreading sequence in the i-th multi-path and the despreading sequence for the j-th multi-path (paragraph 0077).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 2, 6, 8-11, 13, 15, 17, 19, 22-27, 29, 30, 36-39, 41-43, 53-57, 59-61, 69, 70, 72, 73, 80, 86 and 88 are rejected under 35 U.S.C. 103(a) as being unpatentable over Butler et al (US 2002/0131479) in view of Eberhardt et al (US 5,754,583).

Regarding claims 2, 6, 13, 17, 22, 29 and 53, Butler discloses the receiver and method of using the receiver as stated above. Butler does not disclose the rake receiver

generates an estimated channel coefficients. Eberhardt discloses a rake finger generates a weighted channel estimate (column 10, lines 43-63). The channel estimate improves performance of the receiver by reassigning the fingers to more accurately recover the transmitted signal (column 10, line 64 to column 11, line 21) in a communication system where fading occurs. For this reason, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the teachings of Eberhardt into the receiver and method of using the receiver of Butler.

Regarding claims 8, 10, 24 and 25, Butler discloses a RAKE receiver and method of using the RAKE receiver shown in figure 4. Butler discloses a plurality of RAKE fingers to despread symbols received over the multiple paths of a multi-path channel (figure 4). Each finger comprises a delay of each of the multi-paths (paragraph 0077). The receiver outputs a signal from the despreader 442 that represents the cross-correlation between the interfering PN sequences and the PN sequence for the desired multi-path (paragraph 0106). A combiner 438a combines the data to be recovered and the interference component to reduce the ISI attributed to the interference and the desired symbol (figure 4 and paragraphs 0107 and 0109). A symbol combiner 432 combines the symbols from a plurality of RAKE fingers. Butler does not disclose the rake receiver comprising a multi-channel filter to reduce intersymbol interference. Eberhardt discloses a finite impulse response (FIR) filter 200 for the use in the mobile station 100 for providing low pass filtering (column 8, lines 36-42). The filter 200 uses a number of delay elements, multipliers and a summer to output the filtered signal. Filter 200 is found in each finger (figure 1). It would have been obvious for one of ordinary

skill in the art at the time of the invention to utilize the filter of Eberhardt in the receiver and method of using the receiver of Butler. The filter will allow unwanted components of the received signal to be removed and will allow the originally transmitted signal to be recovered correctly.

Regarding claims 9 and 26, Butler does not disclose the rake receiver generates an estimated channel coefficients. Eberhardt discloses a rake finger generates a weighted channel estimate (column 10, lines 43-63). The channel estimate improves performance of the receiver by reassigning the fingers to more accurately recover the transmitted signal (column 10, line 64 to column 11, line 21) in a communication system where fading occurs. For this reason, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the teachings of Eberhardt into the receiver and method of using the receiver of Butler.

Regarding claims 11 and 27, figure 2 of Eberhardt discloses the filter.

Regarding claims 15, 19, 23, 30, 36-39, 41-43, 54-57, 59-61, 69, 70, 72, 73, 80, 86 and 88, Butler discloses the receiver and method of using the receiver as stated above. Butler does not disclose the rake receiver comprising a multi-channel filter to reduce intersymbol interference. Eberhardt discloses a finite impulse response (FIR) filter 200 for the use in the mobile station 100 for providing low pass filtering (column 8, lines 36-42). The filter 200 uses a number of delay elements, multipliers and a summer to output the filtered signal shown in figure 2. Filter 200 is found in each finger (figure 1). It would have been obvious for one of ordinary skill in the art at the time of the invention to utilize the filter of Eberhardt in the receiver and method of using the receiver of Butler.

The filter will allow unwanted components of the received signal to be removed and will allow the originally transmitted signal to be recovered correctly.


**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M. Burd whose telephone number is (571) 272-3008. The examiner can normally be reached on Monday - Friday 9 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on (571) 272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kevin M. Burd  
3/29/2007

  
**KEVIN BURD**  
**PRIMARY EXAMINER**